

Finally, independent claims 1, 13, 22 and 37 are also amended to add substantive limitations going to the nature of the perspective image that is both generated (at the second computer) and displayed (at the first computer). Namely, these claims are amended to require the images rendered by the subject invention to have accurate perspective, thereby to distinguish the claimed invention from other methods of producing images, and images produced by other methods.

2. Rejections Under 35 U.S.C. §102(e) and §103

Claims 1-11, 13-17, 21-31, 37-46 and 51 are rejected under 35 U.S.C. §102(e) as being anticipated by the reference art patent no. 6,727,925 to Bourdelais ["Bourdelais"].

Claims 32-36 and 47-50 are rejected under 35 U.S.C. §103 as being anticipated by the reference art patent to Bourdelais in view of the reference art patent no. 6,572,377 to Masters ["Masters"].

Claims 12, 18, 19 and 20 are rejected under 35 U.S.C. §103 as being anticipated by the reference art patent to Bourdelais in view of the reference art patent no. 6,231,188 Gao et al. ["Gao et al."].

Although Applicants' filing date precedes the publication date of Bourdelais, Applicants herein proceed to patentably distinguish their invention as claimed without forgoing their privilege to swear behind the reference art of Bourdelais should it become necessary.

In general, the independent claim are amended **both** (1) so as to more succinctly and distinctly specify the nature of the true perspective images produced by Applicants' methods and systems, **and**, in so doing, (2) better distinguish over the reference art of Bourdelais.

As an immediate example of (2), claim 1 is amended so as to more succinctly and distinctly specify that the perspective view

images rendered by Applicants' methods and systems have inherently proper perspective. Namely, the rendered perspective image view is proper in camera location, camera angle, and camera lens parameters. The rendered perspective image view is photorealistic.

2. Discussion of Bourdelais, and of Amendments to Applicants' Claims Not Primarily Directed to Distinction of These Claims Over Bourdelais

Although Applicants full well realize that they must distinguish their invention as **claimed** -- and do so in section 3 hereinafter -- Applicants beg the indulgence of the Examiner to first (1) review the showings of Bourdelais in following sections 2.1 and 2.2, and also to section 2.3, to alert the Examiner that they (Applicants) have made certain amendments to their claims which are **not** primarily directed to distinguishing their claimed invention over the prior art of Bourdelais (as is particularly discussed in the following section 2.3).

These matters may thus be considered **preliminary**, and suitably addressed in this section 2., **before** proceeding to argue the patentable distinction of Applicants' amended claims in section 3.

2.1 The System and Method of Bourdelais

Bourdelais teaches a system for designing a room using Internet browser software running on a local computer but connected to a remote computer system, most typically by the Internet. As will be shown below, this system assembles a selected group of scaled and positioned digital *images* (like ordinary photographs) to create a composite perspective view scene. Scaling of images is necessary so that images of furnishings placed at the back of a room appear smaller than similar images placed near the front of the scene.

Unfortunately, scaling can not provide accurate perspective for 3D furnishing objects like chairs in typical interior scenes. Scaling merely adjusts magnification, while changing the camera to subject distance changes the relative position of the arms, legs, back, etc., to each other, and hence the perspective. Depending on the scaling method used, scaling may not even provide accurate size. This is the case when the scene lacks depth information, such as a photograph of a room, and so scaling must be done by eye and is therefore, at best, only approximately correct.

Such compositions are made every day in programs like Adobe PhotoShop. Bourdelais differentiates her invention from everyday PhotoShop processes by fetching the images used to construct the composite composition from the remote computer. Furthermore, in order to compensate for the relatively slow transmission speed of the Internet -- especially when dial-up connections are utilized as was commonplace at the time her patent was filed -- her users initially design their composition using small (low resolution) stand-in digital images, which can be fetched from the remote computer relatively quickly. While the user tinkers with the room scene, for example by varying the placement of furniture images, full-resolution images are fetched in the background. Then, when the composition is complete, full resolution images are substituted for the stand-in images, and a full-resolution composite image (with inaccurate perspective because of the scaling limitations previously discussed) is generated at the browser. These steps can be summarized as follows:

1. A low quality (small pixel size) digital photographic image of a room is selected using the browser, and fetched from the remote computer system.
2. Then for each furniture object to be added to the scene, a low quality perspective view photo, with the proper orientation, is selected from a large library.
3. This library contains numerous photographic or other

photorealistic images of the same furniture items, taken from many different positions.

4. These perspective view photographic images of furniture items are then scaled and overlaid on the room image in the browser in the desired position to create a low quality collage, or composite perspective view photographic image.

5. Finally, from a computer system remote to the browser, higher quality (larger pixel size) images are fetched from the remote computer system, and substituted for the low quality images, so that a high quality composite image can be assembled (a process Bourdelais refers to as ~~rendered~~), and viewed on the browser. Please note that in modern computer graphics, the term ~~rendering~~ is generally defined as the process of taking a 3D geometric description and making a 2D image from a specific view, which most typically results in a perspective view image of proper perspective. Under this conventional definition, for a ~~rendering~~ to take place, geometry must be involved. Using this conventional definition, Bourdelais' methods do not involve ~~rendering~~ at all.

The detail support for the above-numbered steps regarding Bourdelais' system are now presented, by number:

1. In the User Operation section of her patent, Bourdelais states: ~~In~~ step S1501, the user specifies attributes for a room. For example, the user specifies a room type from room type options 66 shown in FIGS. 4 and 5. The browser then shows a perspective view of a room, for example as shown in FIG. 6.~~In~~ In this manner the room image is obtained from a library of photographic images and displayed.

2. Also in the User Operations section of her patent, Bourdelais states: ~~Then~~, in step S1502, the user specifies furnishings to be shown in the perspective view of the room. The furnishings can be specified individually as described above with respect to FIG. 8. Preferably, a group of recommended furnishings also can be requested, as described above with reference to FIG.

12. In response, the browser displays simplified images of the furnishings in the perspective view. These images are obtained by the browser from a remote system.❖

3. In the Server Set-Up section of her patent, Bourdelais states: ❖In more detail, substantially photorealistic perspective images of various furnishings are generated in step S1701. These images preferably include views of the furnishings at various orientations. The images also preferably include multiple variations of the furnishings based on, for example, style, color, manufacturer and materials. The photorealistic images could be obtained, for example, through computer aided design or through use of a digital camera.❖

4. In the Summary of Invention section Bourdelais states: ❖Furthermore, accepting and displaying independent manipulation of the simplified images preferably involves accepting and displaying independent position changes for the simplified images in the perspective view of the room, as well as accepting and displaying independent orientation changes for the simplified images in the perspective view of the room❖.

5. Also in the Server Set-Up section of her patent, Bourdelais states: ❖Preferably, accepting and displaying manipulation of the simplified images also involves scaling the simplified image within the perspective view of the room in accordance with the position changes.❖

6. In the Field of Invention section of her patent, Bourdelais states: ❖In particular, the invention concerns interactively designing a room by specifying attributes for the room, interactively specifying and manipulating plural *images* of furnishing such as furniture in simplified form in a perspective view of the room, and then rendering a perspective view of the furnishings in the room using photorealistic images acquired from the remote system.❖

2.2 The Image of Bourdelais

By these processes Bourdelais produces a composite image that is **only** ~~substantially photorealistic~~ (ABSTRACT of Bourdelais). This is because the objects in the scene image (1) do not cast shadows, (2) are not illuminated from common light sources, and (3) are not viewed from a common camera location. and hence lack accurate perspective.

Applicants do all these things. Applicants produce, and claim to produce, a scene image which said image is (1) viewed from a single camera position, (2) generated from geometry rather than totally 2D images (as in Bourdelais), and (in claim 13) (3) includes proper shadows and scene illumination.

Applicants' perspective image can be ~~photorealistic~~, not just ~~substantially photorealistic~~, because Applicants' renderings have **proper perspective**. Applicants' image is ~~generate[d] and render[ed] in consideration of (5) a camera location and orientation, and object-based rules as to how the selected object exists within the 3D scene,...~~ [to produce] (6) a perspective view image of the selected object in the 3D scene.... ~~(amended claim 1), Applicants' perspective view image... [is thus] in a perspective that is proper in each of (1) scale, (2) position and (3) rotation.... (amended claim 1).~~

What then is the image of Bourdelais? What does it look like? Is Applicants' (claimed) process, and image, obvious over this image, or not?

The image produced by Bourdelais may be imagined. Each object within the composite image of Bourdelais - say a chair and a table - is derived from individual source images that are one of a number of photographs showing the object - the chair or the table - in different rotations from different camera elevations, each photograph from one camera lens at one distance. The object photograph is then (1) selected (from among the photographs taken at different orientations), and (2) expanded (enlarged) or contracted (de-magnified) so as to be of approximate scale so as

to fit within the scene.

The real problem occurs when a number of selected object images (each individually roughly rotated and scaled) are composited into the same scene (which scene itself is taken from a different camera). Each separate image - each separate object and thus the scene itself - is illuminated as if from a different angle, and viewed as if from a different camera! Even if the scale of each composited image is correct, the perspectives of the individual objects don't match each other, or the scene.

2.3 The Nature of Certain of Applicants' Present Amendments to Their Claims that do **Not** Primarily Go to Distinguishing Their Claimed Invention Over Bourdelais

Applicants have amended their claims to more clearly and distinctly claim their invention without substantially changing the scope thereof.

Applicants have, in particular, made certain amendments that ❖ while certainly going to the **scope** of their claims ❖ are **not** ❖ it is respectfully suggested ❖ of primary importance in distinguishing over the primary cited prior art reference of Bourdelais. Applicants proceed **now** to point out these amendments, and to (if deemed necessary by the Examiner) describe the specification support therefore, **before** proceeding to argue the patentable distinctions of their invention, **as claimed**, in next following section 3.

Namely, Applicants have amended their claims so as to state that a ❖perspective view image❖ is produced. A perspective view image is certainly what Applicants' claimed methods and system produce. This image is ❖most strictly ❖ only but 2D when presented on a standard computer monitor. However, this image may be ❖3D❖ when a display technology such as the new 3D LCD display technology of the Sharp Electronics Corporation is employed. This 2D or 3D nature of this perspective image is **not**

the patentable distinction of Applicants' invention. (The Examiner certainly remembers, as just explained, that in this section 2.3 Applicants are simply calling his attention to claim amendments that go to clarity, accuracy and succinctness, and which are **not** primarily directed to distinguishing Applicants' claimed invention over the prior art.)

Likewise, Applicants amendedly claim ~~an object~~, always in a ~~3D scene~~. A 3D object may be, for example, a furnishing such as a chair while a 2D object may be, for example, furnishings such as paint or wallpaper. Thus Applicants' invention deals with more, and other, than **just** 3D objects. (Applicants photorealistic renderings, require, however, a scene that is 3D.)

There is support in the specification for all such clarified claim language.

Namely, specification page 30, lines 16-20 states: "The complete system and tool of the present invention includes each of (I) a large on-line catalog containing 2D images and information for textures and furnishings, which may include fabric, wallpaper, paint colors and finishes, wood finishes upholstered furniture, case goods, art, art objects and decorative accessories, (ii) a library of stock 3D room models that may be interactively sized, an interactive 3D room model generator containing a floor plan tool, and (iii) a library of proprietary 3D furnishings models."

Specification page 30, line 35, states: "The interactive, real-time visualization of an entire room of furnishings, wall and floor coverings, art objects and accessories accorded by the system and method of the present invention is not otherwise, to the best knowledge of the inventors, currently available anywhere (circa 2000)."

Specification page 34, line 9, states "The present invention contemplates both (I) a business method of supporting design professionals including manufacturers and representatives,

and particularly interior designers and decorators, in the realistic visual display of both real and virtual images of complex three-dimensional objects, particularly wall and floor coverings, art work, lighting fixtures, decor accessories, building products and furniture (herein collectively referred to as "furniture" or "furnishings" ..."

Specification page 35, line 10, states: "Although the designer uses his or her skill in each of the selection, three-dimensional placement and orientation, and manipulation of items (typically floor and wall coverings, art work and furniture) in the room, ..."

Specification page 36, line 27, states: "The designer may enhance and customize portions of the rendered room image, such as by virtually hanging 2D pictures or wallpaper ..."

Specification page 38, line 18, states "The image generation service is thus directly making money for the provider of the service as a wholesaler, manufacturer's representative or jobber, of furnishings and building products like tile or wall paper ..."

Specification page 39, line 32, states: "Designers will be able to rapidly identify and select furnishings, place them into a floor-plan view of a room model in the desired position along with decorative accessories, wall and floor coverings, and then rapidly render a screen image of the completed room scene, complete with lighting effects."

Specification page 40, line 1, states "It will also allow new furnishing objects, including furniture upholstered in selected fabrics, wallpaper and carpet to be superimposed with the proper perspective into photographically-derived model images of actual rooms."=20

Specification page 41, line 18, states "This will require creating not only the room model geometry, but also overlays for all walls, floors and ceilings visible in the room scenes."

Specification page 41, line 20, states: "These will be

carefully masked to allow textures like wall paper and carpeting to be accurately rendered on such surfaces without interfering with objects between the camera and the subject surfaces."

Specification page 43, line 12, states: "Room surface textures like wall paper and carpet, or wall paint color (collectively referred to herein as textures) can be selected and applied in a similar manner, by clicking on the texture, and then on any wall, ceiling or floor area designated on a 3D perspective skeletal model of the room. Such skeletal model images will clearly designate individual wall, ceiling floor surfaces that are represented by overlay planes in the associated 3D room model. All such textures will be initially displayed on the associated icon, wall (in the case of wall paper) or floor (in the case of carpets). Ceiling color or texture will be selected for use by clicking on a texture and then on the appropriate area of the 3D perspective skeletal model, but the ceiling will not be visible in the Scene Builder until the image is rendered, as the Scene Builder will not display the ceiling. Selected wall color or wall paper will be applied to each wall surface by first clicking on the texture and then clicking the desired wall segment in the skeletal model."

3. Patentable Distinction of Applicants' Present Invention, as Claimed

3.1 The Patentable Distinction of All Claims Over the Reference Art of Bourdelais

Applicants' claimed invention of computerized methods, and systems, for "presenting a perspective image of a 3D object in a 3D scene" are substantially and distinctly different than the showing of Bourdelais and all other of the art of reference. Applicant claims methods and systems for rendering a proper perspective image of objects, located within 3D scenes of a customer's own choosing, over a digital communications network. Therefore, applicants' rendering methods involve geometry, while

Bordelais methods do not. They are thus fundamentally different, and provide very different results. Moreover, Applicants' generated and displayed perspective view images are distinguished - by claim language that will be identified - to be photorealistic for having proper perspective, meaning that the images have the same perspective that a conventional photo of the same scene would exhibit, if captured by the specified camera and lens. Still more particularly, Applicants' generated and displayed perspective view images proper in each of (1) camera location and orientation, and (2) camera lens parameters.

The gravamen of Applicants' claimed invention is thus **not** what (2D or 3D) objects are imaged, nor even how (as 2D or 3D) the rendered image is displayed, but is rather the **nature** of the image that is rendered and displayed, which image is entirely photorealistic including in **camera view** (i.e., in camera location and angle, and in camera lens parameters including focal length), and also ¶ although this limitation is not present in all independent claims ¶ in scene **illumination**.

Bourdelaïs neither teaches nor suggests the producing such an image. (Bourdelaïs actually mis-uses the word ¶rendering¶ as such word is commonly understood in the graphic arts, where it means production of an image in accordance with a 3D model.)

Applicants' claimed invention of computerized methods, and systems, for ¶presenting a perspective image of an object in a 3D scene¶ are substantially and distinctly different than the showing of Bourdelaïs and all other of the art of reference. Applicants claim methods and systems for rendering photorealistic objects, within 3D scenes of a customer's own choosing, over a digital communications network. Moreover, Applicants' generated and displayed perspective view images are particularly distinguished by specific language ¶ now within each of the independent claims 1, 13, 22 and 37 ¶ as to what it means to be truly photorealistic. Namely, Applicants now claim:

utilizing in the second computer... information...to generate and render in consideration of (5) a camera location and orientation, and object-based rules as to how the selected object exists within the 3D scene, (6) a perspective view image of the selected object in the 3D scene.... (Amended Claim 1) (as exemplary language)

Bourdelaïs neither teaches nor suggests such camera location and orientation, nor object-based rules -- as is more completely explained starting at the second following paragraph.

Moreover, Applicants claim that their perspective view image has the same proper perspective that a conventional photo of the same scene would exhibit, if captured by the specified camera and lens. More particularly, Applicants' generated and displayed perspective view images are both proper and accurate in any, and in each, of (1) scene lighting, (2) camera location and orientation, and (3) camera lens parameters. Specifically, in the language of their claim 1, Applicants specify:

the entire computer-generated perspective view image is rendered with the same proper perspective that a conventional photo of the same scene would exhibit, if captured by the specified camera.... (Amended claim 1)

The perspective views of Bourdelaïs admittedly are, by (1) the language of her ABSTRACT and (2) the processes by which these views are generated, and (3) the compositing of 2D images, only **substantially photorealistic** (boldface added).

Applicants' claimed methods and systems involve various of (1) geometry(ies) (of 3D rooms, 3D room objects and 3D furniture objects); (2) 2D textures applied at render-time in accordance with the specifications of a texture map; (3) virtual lights and lighting calculations; (4) virtual cameras with adjustable virtual optical systems; and a (5) 3D rendering system (like ray tracing) that illuminates the scene with the specified lights

(and eliminates the need for the image scaling step taught by Bourdelais).

Applicants amend their independent claims 1, 13, 22 and 37 so as to more clearly claim their invention, and to thus better patentably distinguish it over Bourdelais and all other of the art of reference.

Applicants specify that their perspective view image is rendered and displayed in a perspective that is proper in each of camera location and orientation... (Claim 1) Bourdelais may indeed (1) scale and (2) position her images (although even here **not** in three-dimensional space), but most assuredly does **not**, and neither teaches nor suggests, using camera location and orientation (Claim 1), as compositing (as opposed to rendering) does not involve virtual cameras. She does not truly rotate her images (which is impossible working from her 2D images). Without a true computer graphics rendering system involving geometry, which applicant claims in Claim 1, it is impossible to generate a perspective view image in which each and all objects are shown with accurate perspective.

Applicants' amended claim 1 specifies that the entire computer-generated perspective view image is rendered and viewed with the same proper perspective that a conventional photo of the same scene would exhibit... if captured by a camera.... (amended Claim 1). Again this is neither taught nor suggested by Bourdelais and is, indeed, impossible unless the scene be rendered using geometry, as taught by Applicant, instead of being composited from photographic images as is taught by Bourdelais.

Bourdelais shows only but to (1) size objects and (2) place them in a scene. Such a scene looks stilted, and artificial, in the manner of a well-proportioned, but still contrived, collage of separate images. This is because that is precisely what it is!

Moreover, and totally unlike Bourdelais, Applicants' methods and systems display mathematically-derived shadows. Bourdelais

teaches nothing about the use of ANY of (1) 3D geometry, (2) texture maps, (3) 3D models, (4) 3D rendering, (5) ray-tracing or other 3D rendering methods, (6) virtual lights or cameras, nor (7) calculated lighting and shadows. This is because her individual furniture and empty room images are simply photographs or other photorealistic 2D images, and her room scenes are simple (1) scaled and (2) positioned composites or collages of such component images.

Neither the term ❖shadow❖ or ❖shadows❖ ever appears in Bourdelais' patent, as her image rendering method -- compositing -- does not generate shadows such as, by way of example, the shadow projected from a chair leg on the floor. So, while Bourdelais' individual furniture item images may be photorealistic, because, for example, they are photographs of a real chair, the composite room scenes produced by her method and system and incorporating such a chair are not photorealistic. Again, this is primarily because her individual furnishings not generate shadows and reflections, such as those seen on a shiny hard-wood floor because (1) they are not 3D objects with geometry, because (2) the objects in the scene were not illuminated with a common light(s), and because (3) they were not photographed from a common point with the same lens and camera.

The differences between processes (elements) and products -- a **composited** image versus a 3D rendering of a ❖[proper] perspective view image having proper perspective showing an object located and oriented within a 3D scene❖ (amended claim 1) -- are so great as to be non-analogous. This is especially true when it is considered that a taught purpose of Applicants' (claimed) methods and systems is to sell furnishings. It is felt that few or no prospective buyers will purchase items that may be expensive -- such as furniture -- solely from visual representations amounting to a mere collage of images with inaccurate perspective.

Independent claim 22 specifies ❖generating at the server from the (4a) 3D model of the real-world space, the (5a) 3D model of

the real-world object and the (6) plurality of object-based rules, a (7) static perspective view of a (7a) 3D real-world object corresponding to the (3a) selected icon properly located and oriented relative to a (7b) 3D real-world space corresponding to the (1a) selected real-world 2D scene image. Such a generating, or rendering, proceeding from 3D models of room(s) and objects is neither taught nor suggested by Bourdelais.

Additional independent claims are patentable for like reasons, and for additional reasons discussed in previous Amendments.

Bourdelais does not truly (1) rotate her images (which is impossible working from her 2D images), nor (2) view them as from a single camera, nor, for that matter, (3) illuminate them in combination as from one or more predetermined source(s). As regards this unified and coherent (2) camera view, and (3) illumination, understand that Bourdelais is working only with 2D images of the order of photographs, each of which may be taken by a different camera at a different time from a different camera position under different lights. And even if each and all these photographic images is taken under the same conditions, it is impossible to assemble the images at different points in a scene where each is illuminated from a light source or sources of the scene! Without ray tracing or the like in there dimensions as is performed **(by rendering, and not compositing) only** by Applicants' invention, it is **impossible** to assemble images in a single view where each and all are shown as illuminated by the same light source(s).

Next, and further, Applicants' amended claim 1 specifies that the entire perspective view image is rendered and viewed as if the same proper perspective that a conventional photo of the same scene would exhibit... if captured by a camera (claim 1). (Note that a camera impliedly has a lens having lens parameters, and is located at a single viewing location.) Again this is neither taught nor suggested by Bourdelais and is, indeed, impossible but

that the scene be rendered in three dimensions -- as taught by Applicants -- **instead** of being composited from photographic-like images as is shown by Bourdelais.

Thus Applicants' invention is directed to making photorealistic 3D images as with a camera. All objects in the 3D scene are as if viewed from a single camera having a lens of fixed lens parameters (mainly focal length) at a single time. Indeed, all objects in the scene are properly illuminated as if from a common light source or sources at defined positions, replete with shadows if any be present. Applicants so claim their invention. (For the claiming of ❖scene lighting❖, see claim 13.)

Meanwhile, Bourdelais shows only but to (1) size objects and (2) place them in a scene. Such a scene looks stilted, and artificial, in the manner of a well-proportioned, but still contrived, **collage** of separate images. This is because that is precisely what it is!

Moreover, and totally unlike Bourdelais, Applicants' methods and systems suffice to display photorealistic mathematically-derived shadows. Bordelais teaches nothing about the use of ANY of (1) 3D geometry, (2) texture maps, (3) 3D models, (4) 3D rendering, (5) ray-tracing or other 3D rendering methods, (6) virtual lights or cameras, nor (7) calculated lighting and shadows. This is because her individual furniture and empty room images are simply photographs or other photorealistic 2D images, and her room scenes are simple (1) scaled and (2) positioned composites or collages of such component images.

Neither the term ❖shadow❖ or ❖shadows❖ ever appears in Bordelais' patent, as her image rendering method -- compositing -- does not generate shadows such as, by way of example, the shadow projected from a chair leg on the floor. So, while Bourdelais' individual furniture item images may be photorealistic, because, for example, they are photographs of a real chair, the composite room scenes produced by her method and

3.2 Rejection of Claims 32-36 and 47-50

The rejection of claims 32-36 and 47-50 under 35 U.S.C. §103 as being anticipated by the reference art patent to Bourdelais in view of the reference art patent no. 6,572,377 to Masters ["Masters"], does not account for the ❖lighting effects❖ specifically claimed within claim 24, upon which claim 24 claims 32-36 are dependent. Claim 24 is patentable for even more distinctly specifying the lighting that is present with a geometry-based rendering system -- which lighting is neither taught nor suggested by Bourdelais as argued for claim 1 above -- than does claim 22.

Additionally, claims 32-36 are ultimately dependent upon independent claim 22, which is patentable for the same reasons -- argued above -- as is claim 1.

Likewise, claims 47-50 are ultimately dependent upon independent claim 37, which is patentable for the same reasons -- argued above -- as is claim 1.

3.3 Rejection of Claims 12, 18, 19 and 20

Claims 12, 18, 19 and 20 were rejected under 35 U.S.C. §103 as being anticipated by the reference art patent to Bourdelais in view of the reference art patent no. 6,231,188 Gao et al. ["Gao et al."]. Goa, et al, does nothing to remedy the failure of Bourdelais to teach the generations of a photorealistic 3D perspective image.

Claim 12 is thus patentable for the same reasons as is claim 1, upon which claim 12 depends.

Likewise, claims 18-20 are dependent upon claim 13, which is patentable for the same reasons argued above for claim 1.

4. Summary

The present amendment and remarks have overcome and discussed each of the bases for the rejections presented in the Office

Action. No new subject matter has been introduced by the present amendment.

In consideration of the preceding amendment and accompanying remarks, the present amendment is deemed worthy of entrance, and the present application is deemed in condition for allowance. The timely action of the Examiner to that end is earnestly solicited.

Applicants' undersigned attorney is at the Examiner's disposal should the Examiner wish to discuss any matter which might expedite prosecution of this case.

Sincerely yours,

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CERTIFICATION UNDER 37 CFR 1.10

I hereby certify that this AMENDMENT and the documents referred to as attached therein are being deposited with the United States Postal Service addressed to: Mails Stop Amendment After Final - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date written below.

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